# 2. CORRIDORS NEEDS ANALYSIS

As previously explained, the purpose of the corridor needs analysis is to identify the corridor(s), or portions of the corridors that will:

§ Attract enough volume in 2030 to warrant a major transportation facility;
§ Provide relief to other transportation facilities within the study area, and;
§ Improve inter-regional and intra-regional mobility within the study area.

**Section 2.1** describes the transportation demand model that formed the basis of needs analysis. **Section 2.2** presents the findings and conclusions of the needs analysis.

## 2.1 Pinal County Planning Model

The needs analysis is based upon the projected number of vehicles that will use the roadway system within the study area in the year 2030. This vehicle demand is estimated by creating various scenarios in the Pinal Corridors Planning Model[1]. Scenarios developed with the PCPM ranged from the base condition 'no-build' (no new corridors are constructed), to 'construct all new corridors'. These scenarios were incrementally analyzed to create a final scenario – the Corridor Concept. The Corridor Concept scenario includes the portions of the study corridors that meet the needs analysis criteria listed above.

**Table 2-1** is a synopsis of each step of the scenario modeling process that was followed to develop the Corridor Concept. The emergent Corridor Concept was then carried forward to the feasibility analysis that is described in **Section 3.0**.

**Table 2-1 – Needs Analysis Scenarios**

| Scenario | Description |
|---|---|
| Step 1 –2030 Base Future Network | • No new freeway corridors;<br>• All planned or programmed investments in Maricopa County consistent with 2030 Maricopa Association of Governments Regional Transportation Plan;<br>• Planned and programmed investments in Pinal County; as consistent with Pinal County Transportation Improvement Program, Pinal County Small Area Transportation Plan, Apache Junction Small Area Transportation Plan, plus very basic arterial infrastructure that will be required to support future development that will be constructed in conjunction with large developments and master planned communities.<br>• Development of an arterial system through State Trust Lands;<br>• Widening of existing arterials to 4 lanes throughout Pinal County;<br>• No change to the existing state highway system, except for I-10, which is expected to be widened to 6 lanes. |

[1] Pinal County Corridors Definition Study, Working Paper No. 1 – Existing and Future Conditions, Needs and Deficiencies. June 1, 2005. Available at http://tpd.azdot.gov/planning/corridorstudies.php.

**Table 2-1 – Needs Analysis Scenarios (continued)**

| Scenario | Description |
|---|---|
| Step 2 –2030 Enhanced Future Network | • No new freeway corridors;<br>• Improvements as described in the 2030 Base Future Network, with the following modifications:<br>- Widening the future arterial network in Pinal County from 4 to 6 lanes north of SR 287;<br>- Widening the non-interstate state highway network from 2 to 4 lanes.<br>• No changes to improvements identified in the MAG Regional Transportation Plan. |
| Step 3 –2030 SEMNPTS Corridors Network | • Improvements as described in 2030 Base Future Network;<br>• The four (4) corridors proposed by the 2003 Southeast Maricopa/Northern Pinal Transportation Study;<br>- Apache Junction/Coolidge Corridor (North-South Corridor) extending from US 60 at Idaho Road (Apache Junction) to I-10 at SR-87 (Eloy);<br>- East Valley Corridor (East-West Corridor), extending from I-10 (Chandler) to US 60 (Florence Junction);<br>- US 60 Re-route *(Refer to US 60 Corridor Study);*<br>- Williams Gateway Corridor, extending from Pinal County line to US 60 (*Refer to MAG Williams Gateway Corridor Study*); |
| Step 4 –2030 Corridor Concept Network | • Improvements as described in 2030 Base Future Network;<br>• New corridors with facility level and number of lanes determined based upon a joint study team review of traffic volumes on the 2030 SEMNPTS Corridors Network, and from analysis of a number of "what-if" scenarios as described in Appendix A. The Corridor Concept includes:<br>- Apache Junction/Coolidge Corridor (North-South Corridor) extending from Williams Gateway Corridor alignment (approx. Frye Road) to SR-287 in Florence.<br>- US 60 Re-route *(Refer to US 60 Corridor Study);*<br>- Williams Gateway Corridor, extending from Pinal County line North-South corridor (*Refer to MAG Williams Gateway Corridor Study*); |
| Step 5 –2030 Corridor Concept Network (Plus State Highway Improvements) | • All improvements as described in Corridor Concept Network.<br>• Improvement of existing non-interstate state highway facilities (e.g., SR-79, SR-287) to 4-lanes. |

### 2.1.1 2030 Base Future Network

The 2030 Base Future Network represents the expected future transportation system in the study area in the year 2030 with the understanding that this future system may change as a result of ongoing and future transportation planning studies in Pinal County. The 2030 Base Future Network is based on the existing plans of Maricopa Association of Governments, Pinal County, local cities and towns, and assumptions about the basic arterial network that will be needed support expected future development.

The 2030 Base Future Network represents the baseline 'no-build' scenario which represents conditions in the year 2030 assuming that none of the study corridors are constructed.

As outlined in **Table 2-1**, the 2030 Base Future Network includes the following elements:

§ Roadway improvements within Maricopa County are consistent with the Maricopa Association of Governments 2030 Regional Transportation Plan (MAG RTP). The MAG RTP includes arterial widening and the extension of the grid system.

§ Roadway improvements in Pinal County are consistent with the Pinal County Transportation Improvement Program and Pinal County Transportation Plans. In addition, it was assumed that a basic 4-lane arterial system will continue to be implemented and expanded (by developers and builders) as the rapid pace of development continues.

§ The number of lanes on the non-interstate state highway system (SR-79, SR-87, SR-287) remains as it is today (generally 1-lane in each direction).

§ Interstate-10 is widened to 3 lanes in each direction.

The roadway system that is modeled in the 2030 Base Future Network is depicted in **Figure 2-1**.

Any new corridors that are included in the final recommendation must demonstrate that they favorably improve traffic conditions as compared to the 2030 Base Future Network.

### 2.1.2 2030 Enhanced Future Network

The 2030 Enhanced Future Network includes all of the arterial and freeway improvements that are included in the 2030 Base Future Network, and some additional local and regional investments in the transportation network. No new corridors are included in the 2030 Enhanced Future Network. The purpose of this scenario was to evaluate the benefits that would result from additional investments and expansion in the arterial system in Pinal County. The 2030 Enhanced Future Network is focused primarily on developing a more mature arterial system in the portion of Pinal County that is currently State Trust Land, but is expected to have substantial additional population by the year 2030. As outlined in **Table 2-1**, the 2030 Enhanced Future Network includes the following elements:

§ Improvements as described in the 2030 Base Network, with the following modifications:

- The basic arterial system in Pinal County, north of SR-287, is widened from 4 to 6 lanes. The basic arterial system in Pinal County, south of SR-287, remains at 4 lanes.
- The number of lanes on the non-interstate state highway system (SR-79, SR-87, and SR-287) is expanded to 4 lanes.

The roadway system that is modeled in the 2030 Base Enhanced Network is depicted in **Figure 2-2**.

### 2.1.3 2030 Southeast Maricopa/Northern Pinal Transportation Study (SEMNPTS) Corridors Network

The corridors recommended in the *Southeast Maricopa/Northern Pinal Transportation Study* are modeled in the 2030 SEMNPTS Corridors Network. The corridors, as recommended in SEMNPTS, provided a starting point for the corridors needs analysis. The 2030 SEMNPTS Corridors Network contains the following improvements:

§ Improvements as described in 2030 Base Network;

§ The four corridors proposed by the *2003 Southeast Maricopa/Northern Pinal Transportation Study*. These are:

- Apache Junction/Coolidge Corridor (North-South Corridor) extending from US 60 at Idaho Road (Apache Junction) to I-10 at SR-87 (Eloy);
- East Valley Corridor (East-West Corridor), extending from I-10 (Chandler) to US 60 (Florence Junction);
- US 60 Re-route (Refer to *US 60 Corridor Study*);
- Williams Gateway Corridor, extending from Pinal County line to US 60 (Refer to *MAG Williams Gateway Corridor Study*);

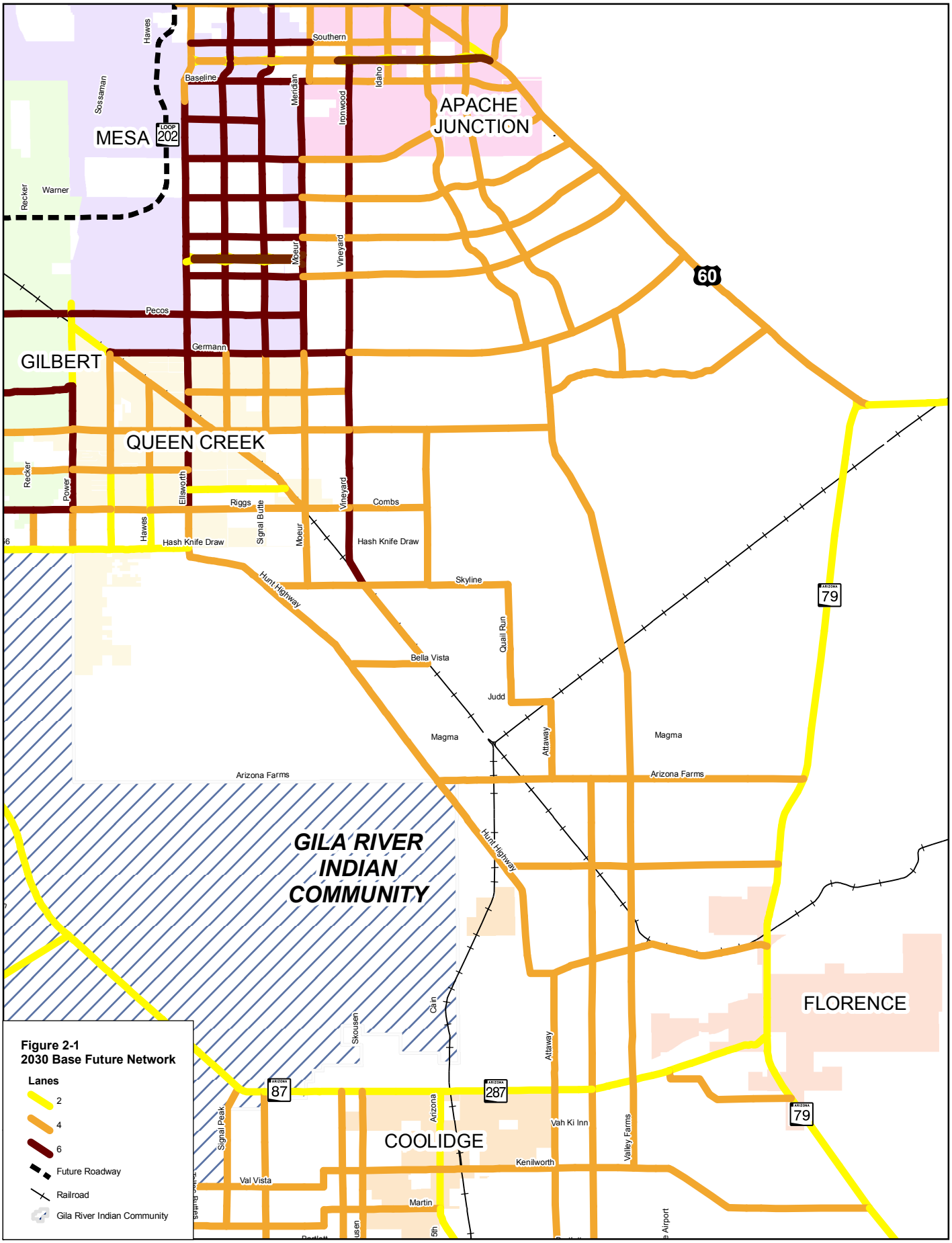
The SEMNPTS Corridors Network is depicted in **Figure 2-3**. The SEMNPTS corridors illustrated in Figure 2-3 reflect refinements in the corridors and a possible scenario of a future arterial road network system in Pinal County that were communicated to ADOT by Pinal County and local jurisdictions during meetings conducted for this study.

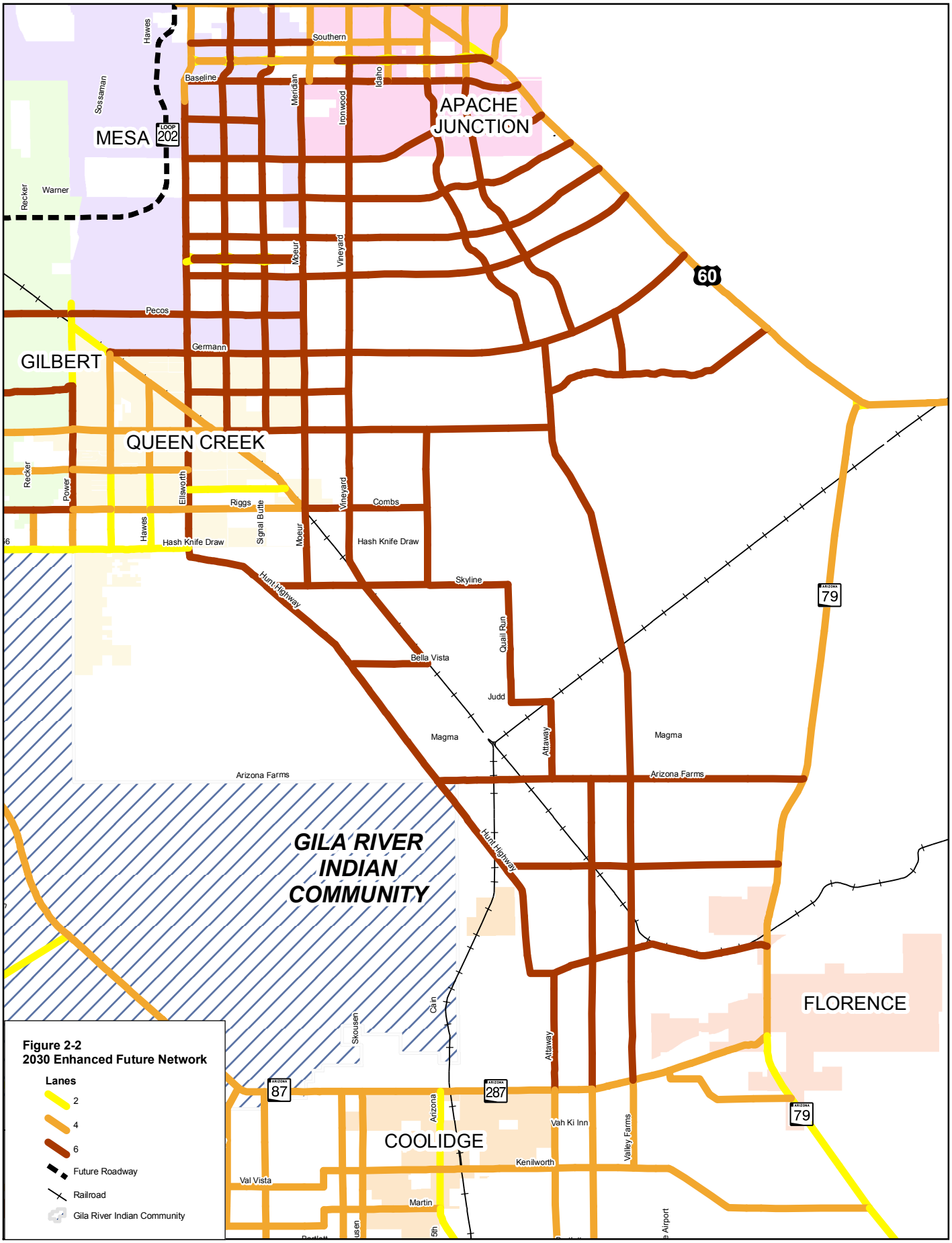
### 2.1.4 2030 Corridor Concept Network

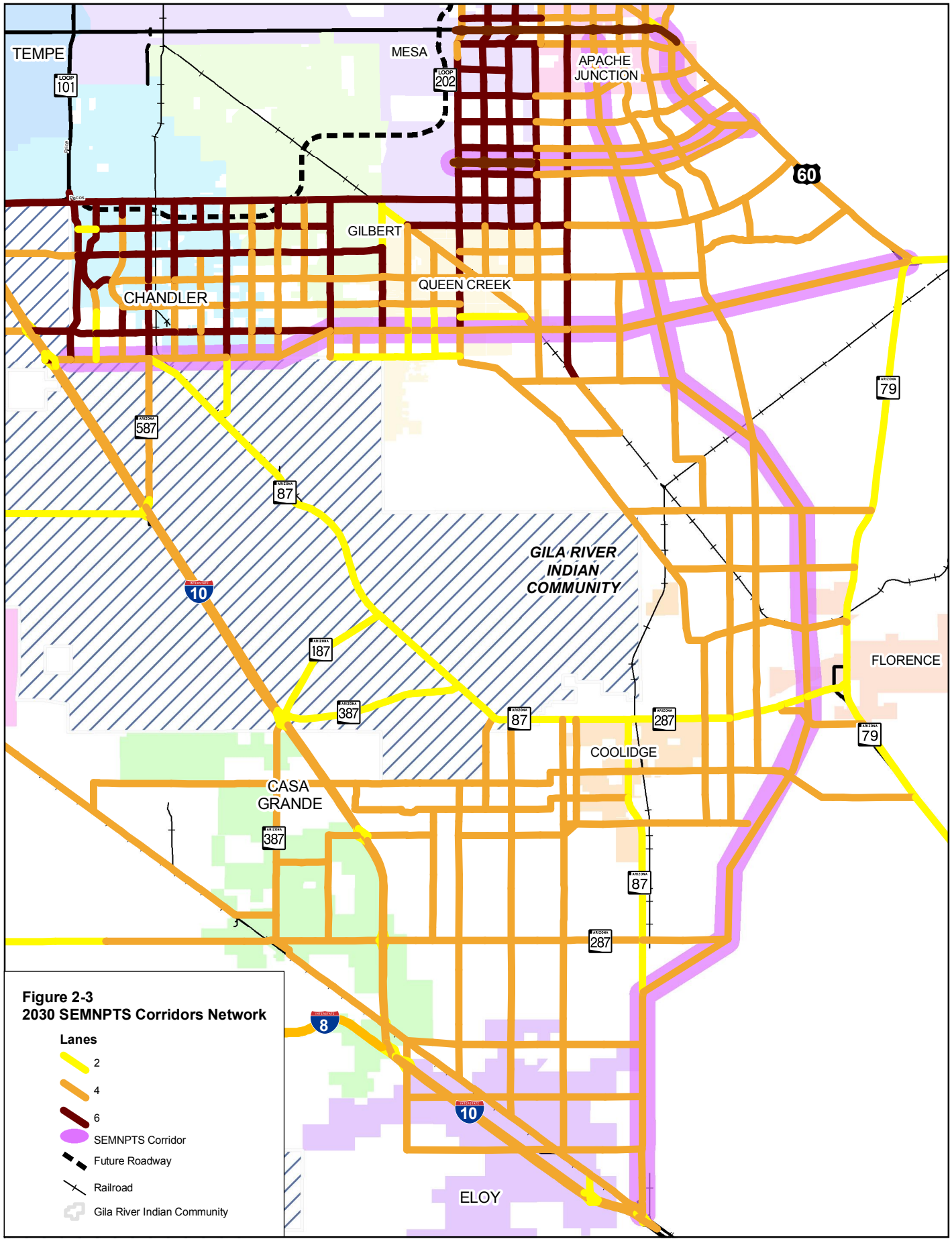
The 2030 Corridor Concept Network was developed based on analysis and review of the 2030 Base Future Network, 2030 Enhanced Future Network, the 2030 SEMNPTS Network, and a series of iterative model scenarios (described in **Appendix A**). Detailed discussion of this network is deferred until **Section 2.4.**

### 2.1.5 2030 Corridor Concept Network (Plus State Highway Improvements)

The 2030 Corridor Concept (Plus State Highway Improvements) Network contains the 2030 Corridor Concept and additional improvements to the State Highway System. Specifically, the non-interstate state highways (SR-87, SR-287, SR-79) within the study area are assumed to be 4 lanes.


Hawes
Southern
Baseline
Sossaman
Meridian
Idaho
Ironwood
APACHE JUNCTION
MESA
LOOP 202
Recker
Warner
Moeur
Vineyard
60
Pecos
Germann
GILBERT
QUEEN CREEK
Recker
Power
Ellsworth
Riggs
Signal Butte
Vineyard
Combs
Hawes
Hash Knife Draw
Moeur
Hash Knife Draw
Hunt Highway
Skyline
79
Quail Run
Bella Vista
Judd
Magma
Attaway
Magma
Arizona Farms
Arizona Farms
GILA RIVER INDIAN COMMUNITY
Hunt Highway
FLORENCE
Cain
Skousen
Attaway
87
287
Arizona
Vah Ki Inn
Signal Peak
COOLIDGE
Valley Farms
79
Kenilworth
Val Vista
Martin
Airport
Figure 2-1
2030 Base Future Network
Lanes
2
4
6
Future Roadway
Railroad
Gila River Indian Community
N
0 1 2 3 4 5 Miles
Data Source:
Arizona Land Resource Information System
PINAL COUNTY CORRIDORS DEFINITION STUDY
Kimley-Horn and Associates, Inc.
ADOT


Hawes
Southern
Baseline
Sossaman
Meridian
Idaho
Ironwood
APACHE JUNCTION
MESA
LOOP 202
Recker
Warner
Moeur
Vineyard
60
Pecos
Germann
GILBERT
QUEEN CREEK
Recker
Power
Ellsworth
Riggs
Signal Butte
Vineyard
Combs
Hawes
Hash Knife Draw
Moeur
Hash Knife Draw
Hunt Highway
Skyline
79
Quail Run
Bella Vista
Judd
Magma
Attaway
Magma
Arizona Farms
Arizona Farms
GILA RIVER INDIAN COMMUNITY
Hunt Highway
FLORENCE
Skousen
Cain
Attaway
87
287
79
Arizona
Vah Ki Inn
Valley Farms
COOLIDGE
Kenilworth
Val Vista
Martin
Airport
Figure 2-2
2030 Enhanced Future Network
Lanes
2
4
6
Future Roadway
Railroad
Gila River Indian Community
N
0 1 2 3 4 5 Miles
Data Source:
Arizona Land Resource Information System
PINAL COUNTY CORRIDORS DEFINITION STUDY
Kimley-Horn and Associates, Inc.
ADOT


TEMPE
MESA
APACHE JUNCTION
LOOP 101
LOOP 202
60
GILBERT
QUEEN CREEK
CHANDLER
79
ARIZONA 587
ARIZONA 87
GILA RIVER INDIAN COMMUNITY
10
ARIZONA 187
FLORENCE
ARIZONA 387
ARIZONA 87
ARIZONA 287
79
COOLIDGE
CASA GRANDE
ARIZONA 387
87
287
8
10
ELOY
Figure 2-3
2030 SEMNPTS Corridors Network
Lanes
2
4
6
SEMNPTS Corridor
Future Roadway
Railroad
Gila River Indian Community
N
0 1 2 3 4 5 Miles
Data Source:
Arizona Land Resource Information System
PINAL COUNTY CORRIDORS DEFINITION STUDY
Kimley-Horn and Associates, Inc.
ADOT

## 2.2 Needs Analysis Findings

The modeling results of the 2030 Base Future Network are shown in **Figure 2-4**, and for the 2030 SEMNPTS Network in **Figure 2-5**. Each figure displays traffic volumes and the level of congestion projected in the year 2030. Level of congestion is determined by calculating a traffic volume-to-roadway capacity ratio for each roadway segment. Roads with a traffic volume-to-roadway capacity ratio of less than 0.8 are considered uncongested. Roads with a traffic volume-to-roadway capacity ratio between 0.8 and 1.0 are considered moderately congested, and roads with a volume-to-capacity ratio greater than 1.0 are considered congested.

Incremental analysis of the results of the 2030 Base Future Network scenario and for the 2030 SEMNPTS Network scenario, in addition to analysis of several 'what-if' scenarios, led to the development of the Corridor Concept. Specifically, this analysis consisted of the following steps:

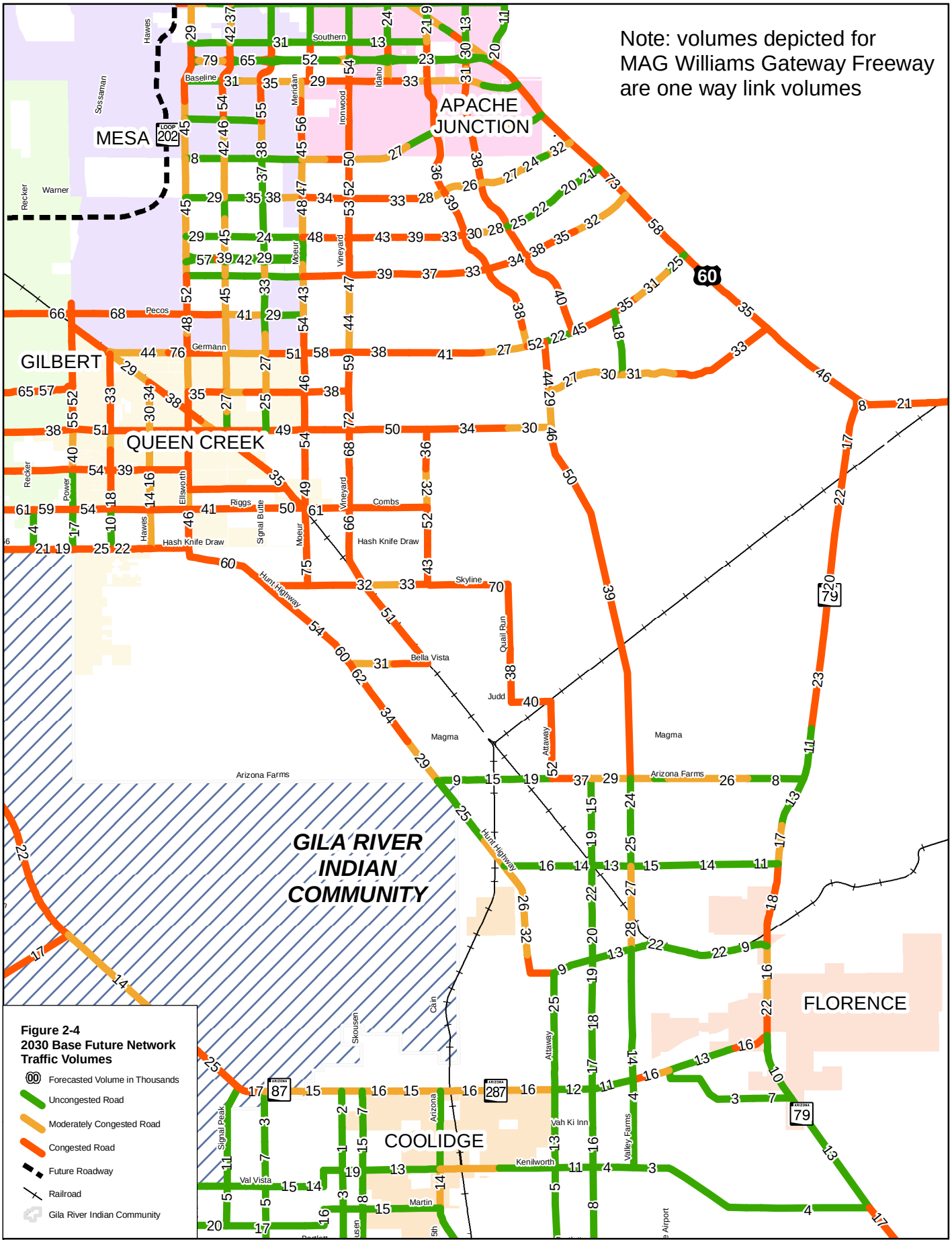
- ADOT and all three study teams (Kimley-Horn and Associates, Cambridge Systematics, Lima and Associates) jointly reviewed the results of the 2030 Base Future Network and for the 2030 SEMNPTS Corridors Network. Based upon the joint review, the SEMNPTS corridors were divided into segments consistent with the location of other infrastructure, proposed roads, jurisdictional boundaries, and the level of traffic volume. The corridors segments are illustrated in **Figure 2-6**.
- Following division of the corridors into segments, the facility type (e.g., arterial, parkway, and freeway) and the number of lanes assigned to each SEMNPTS corridor was reevaluated. The number of lanes and facility type were reassigned to be consistent with what is needed to support the projected traffic volumes. **Table 2-2** shows the facility type and number of lanes that were reassigned to each corridor segment for the North-South corridor and the East-West corridor.

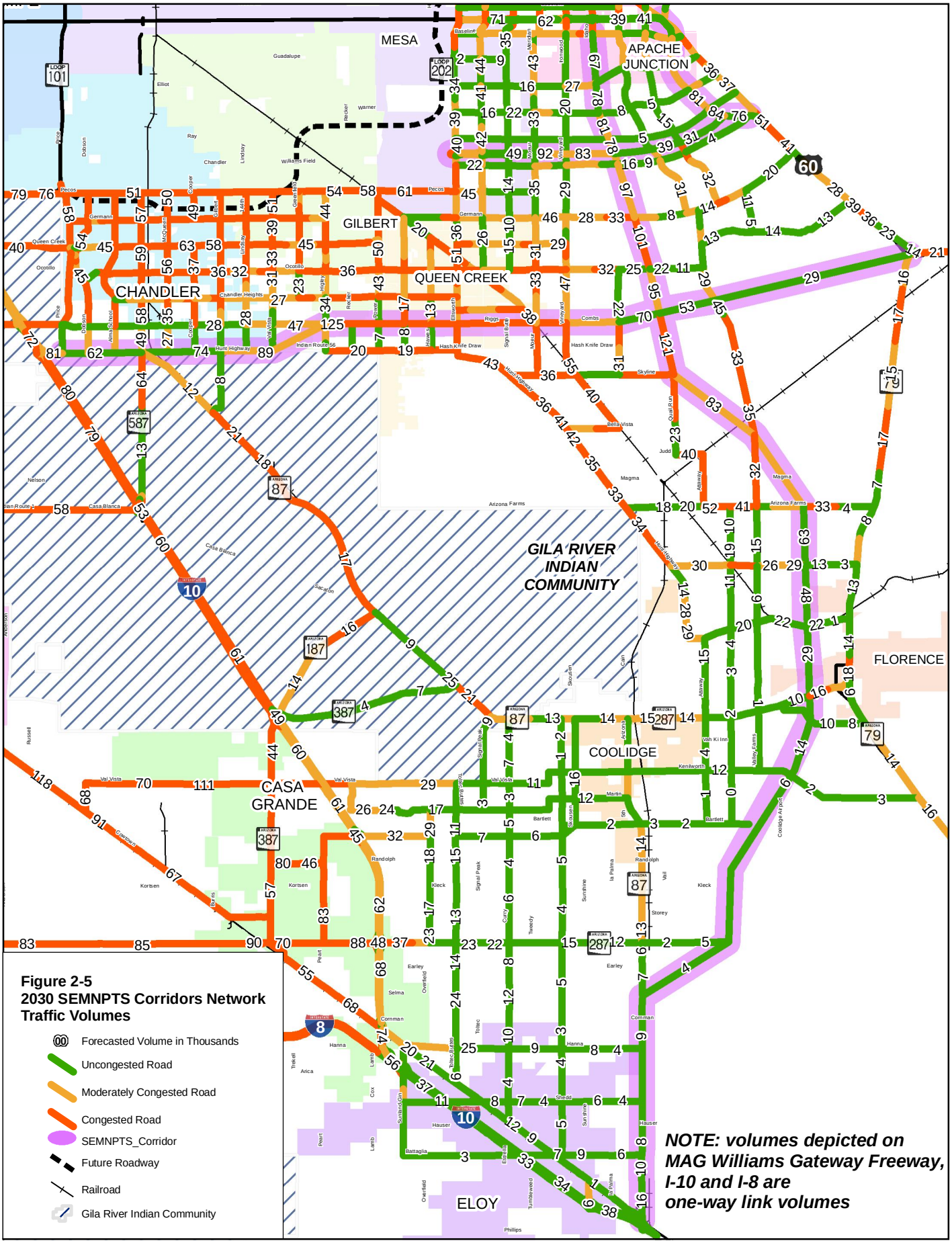
**Table 2-2 – Lanes and Facility Level Assignments by Corridor Segment**

| Corridor Segment | Segment Description | Model Assumptions for Facility Level and Number of Lanes |
|---|---|---|
| **North-South Corridor (Apache Junction/Coolidge Corridor)** | | |
| 1 | I-10 to SR-287 | 4 lane uncontrolled facility on existing SR-87, 2 lane limited access on new alignment to intersection with SR-287 |
| 2 | SR-287 to East Valley Corridor | Access controlled (freeway) 6 lanes |
| 3 | East Valley Corridor to Williams Gateway | Access controlled (freeway) 6 lanes |
| 4 | Williams Gateway to US 60 | Uncontrolled 4 lanes |
| **East-West Corridor (East Valley Corridor)** | | |
| 5 | I-10 to Queen Creek | Limited access 6 lanes on existing Hunt Highway alignment |
| 6 | Queen Creek to North/South Corridor | Access controlled 6 lanes on existing Riggs Road alignment |
| 7 | North/South Corridor to Florence Junction | Limited access 4 lanes |

- The model was re-run yielding updated traffic volumes for each of the revised corridor segments. A number of additional 'what-if' scenarios were developed and the model was run

for each scenario. A description of the 'what-if' scenarios is included in **Appendix A**. The study teams jointly reviewed traffic volumes for each 'what-if' scenario. Corridor segments were again refined (facility levels and number of lanes modified) resulting in the Corridor Concept. Corridor segments that did not attract sufficient traffic volumes to warrant a new corridor, or did not demonstrate a benefit to the surrounding arterial network were not included in the Corridor Concept. The Corridor Concept is explained in detail in **Section 2.3**.


Note: volumes depicted for MAG Williams Gateway Freeway are one way link volumes
MESA
APACHE JUNCTION
GILBERT
QUEEN CREEK
COOLIDGE
FLORENCE
GILA RIVER INDIAN COMMUNITY
Arizona Farms
Magma
Hash Knife Draw
Hunt Highway
Bella Vista
Skyline
Combs
Riggs
Germann
Pecos
Southern
Baseline
Warner
Recker
Power
Ellsworth
Signal Butte
Meridian
Idaho
Ironwood
Vineyard
Moeur
Hawes
Sossaman
Quail Run
Judd
Attaway
Cain
Skousen
Arizona
Signal Peak
Val Vista
Martin
Kenilworth
Vah Ki Inn
Valley Farms
Figure 2-4
2030 Base Future Network
Traffic Volumes
Forecasted Volume in Thousands
Uncongested Road
Moderately Congested Road
Congested Road
Future Roadway
Railroad
Gila River Indian Community
N
0 1 2 3 4 5 Miles
Data Source:
Arizona Land Resource Information System
PINAL COUNTY CORRIDORS DEFINITION STUDY
Kimley-Horn and Associates, Inc.
ADOT


MESA
APACHE JUNCTION
GILBERT
QUEEN CREEK
CHANDLER
GILA RIVER INDIAN COMMUNITY
FLORENCE
COOLIDGE
CASA GRANDE
ELOY
LOOP 101
LOOP 202
60
10
8
87
387
187
587
79
287
Figure 2-5
2030 SEMNPTS Corridors Network
Traffic Volumes
00 Forecasted Volume in Thousands
Uncongested Road
Moderately Congested Road
Congested Road
SEMNPTS_Corridor
Future Roadway
Railroad
Gila River Indian Community
NOTE: volumes depicted on MAG Williams Gateway Freeway, I-10 and I-8 are one-way link volumes
N
0 1 2 3 4 5 Miles
Data Source:
Arizona Land Resource Information System
PINAL COUNTY CORRIDORS DEFINITION STUDY
Kimley-Horn and Associates, Inc.
ADOT

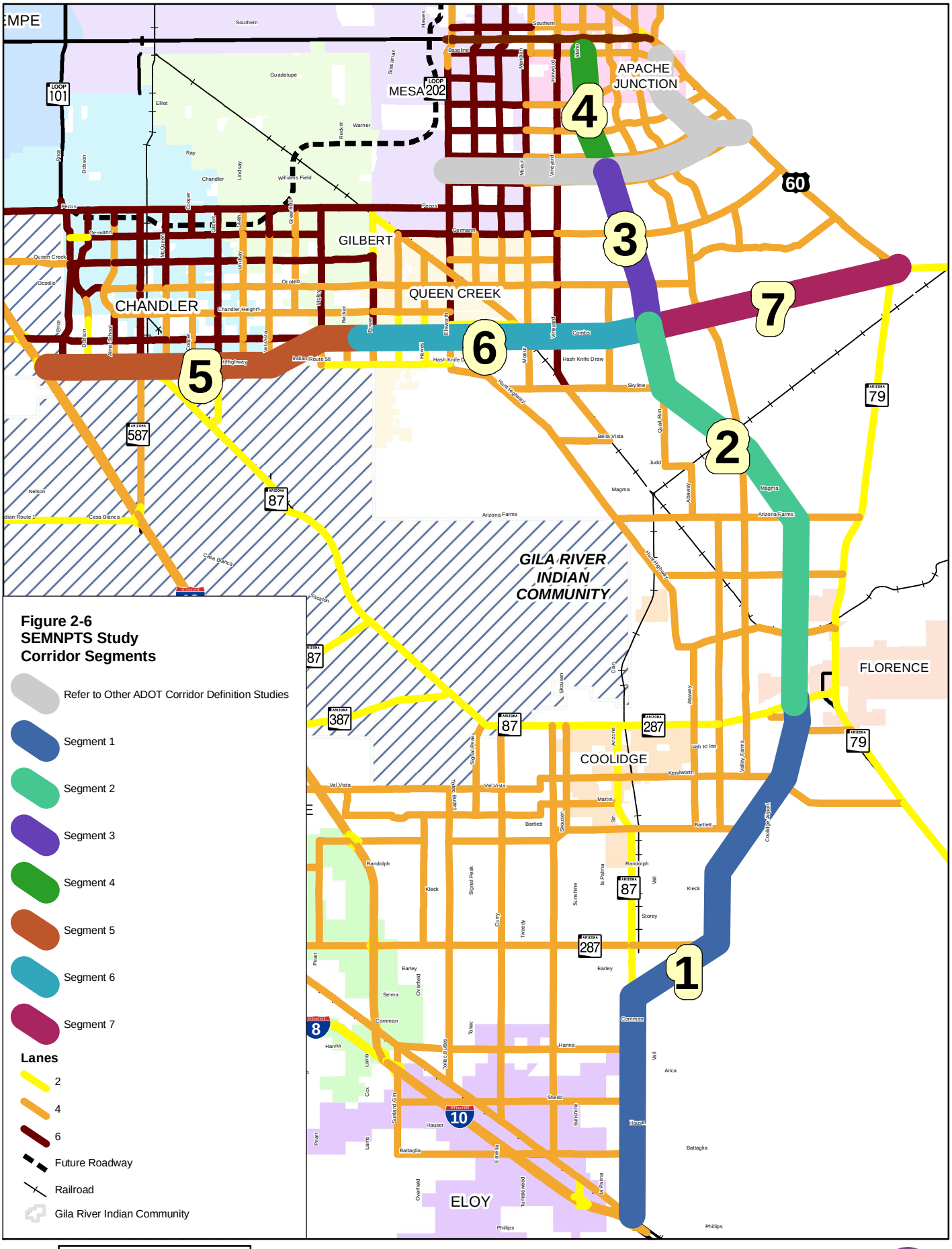



**Figure 2-6**
**SEMNPTS Study**
**Corridor Segments**

### 2.2.1 Needs Analysis Findings for North-South Corridor

The North-South corridor as initially identified by the 2003 Southeast Maricopa/Northern Pinal Transportation Study would provide a high-level, access controlled facility to connect the US 60 near Apache Junction to I-10 near Eloy.

**Table 2-3** is a summary of needs analysis findings for each segment of the North-South corridor, and the degree to which 2030 travel on each corridor segment satisfies the required criteria. The needs analysis did not consider future conditions beyond 2030. As described in **Table 2-3**, the following conclusions can be drawn from the needs assessment for the North-South corridor:

- In the future, major travel movement is forecast between northern Pinal and southeast Maricopa Counties. Residents in Florence, Coolidge, and along the Hunt Highway will require access to employment centers that will be located to the northwest in the Williams Gateway area and in Maricopa County. A need is demonstrated for the North-South corridor as an access controlled multi-lane freeway to accommodate the projected travel demand.
- A need is demonstrated for the Williams Gateway corridor to be extended eastward into Pinal County until it intersects with the North-South corridor. The connection with the North-South corridor will establish connectivity between the Coolidge/Florence area and the MAG Freeway System, including in the Loop 202.
- No need is demonstrated for the North-South corridor south of SR 287. The future arterial system will be able to accommodate the projected traffic demand.
- No need is demonstrated for the North-South corridor north of the Williams Gateway corridor. A local parkway facility can accommodate the projected traffic volumes.
- Implementation of the North-South corridor does not eliminate congestion issues on the arterial networks, but significantly improves their operations. This is particularly true for north-south arterials.

### 2.2.2 Needs Analysis Findings for East-West Corridor

The East Valley corridor as initially identified by the 2003 Southeast Maricopa/Northern Pinal Transportation Study would provide a high-level, access controlled facility on the Hunt Highway/Riggs Road alignment along the southern boundary of Maricopa County. The corridor would connect I-10 in Chandler to the US 60 at Florence Junction.

Analysis of the Pinal County Planning Model scenarios reveals that while traffic volumes may justify the need for certain segments of an East-West corridor, other considerations do not demonstrate that an East-West corridor would provide a system-wide benefit. **Table 2-4** contains a summary of the needs analysis findings for each segment of the East-West corridor, and the degree to which 2030 travel on each corridor segment satisfies the required criteria. The needs analysis did not consider future conditions beyond 2030. From the analysis, the following conclusions can be drawn:

- No need is demonstrated for the East-West corridor along segment 5 between I-10 and Val Vista Road. Traffic volumes may be accommodated by an arterial facility.
- Traffic volumes on segment 6, between Val Vista Road and the Central Arizona Project Canal, may warrant a freeway-level facility. However, improving segment 6 to a freeway-level facility does not meet other criteria, including:
  - Establishing regional connectivity between population centers. As segment 5 of the East-West corridor does not attract enough volume to warrant a freeway-level

facility, the East-West corridor would not provide continuity with the existing state highway system. In order for the East-West corridor segment to be constructed as a state-owned facility freeway facility, it must serve inter-regional or intra-regional trips, establish connectivity between population centers or regions, or connect other high-capacity state routes.

- Segment 6 of the East-West corridor replicates the arterial system. This segment primarily serves local traffic (e.g. traffic exits the corridor within a very short distance of its entrance). Analysis of this corridor shows that even if this corridor segment was developed as a freeway facility, the condition of parallel arterials would not considerably improve. The absence of a mature arterial network in Gilbert, and Queen Creek creates congestion that is not resolved by the East-West corridor

§ No need is demonstrated for the East-West corridor, as a freeway facility, east of the Town of Queen Creek/Central Arizona Project Canal (segment 7). In the future (beyond 2030), this segment may be considered for development by local jurisdictions as a semi-access controlled parkway or expressway facility.

A summary of the needs analysis findings for the North-South corridor and for the East-West corridor is presented in **Figure 2-7**.

### *2.2.3 High-Capacity Transit*

As seen in the needs analysis, travelers within the study area predominantly desire to travel in a southeast to northwest pattern. Maricopa County communities such as Chandler and Gilbert are expected to provide a large number of concentrated employment opportunities over the next 25 years. However, these communities are also projected to reach build-out conditions and thus requiring employment opportunities to be filled by residents that will commute into these communities.

Residents in Coolidge, Florence, San Tan, and along the Hunt Highway corridor will desire access to employment centers located to the northwest. However, significant geographic constraints (Gila River Indian Community, mountains, and regional parks), as well as continuing development pressures, limit the opportunity for multiple southeast-northwest corridors to accommodate them. As such, local jurisdictions and regional agencies should consider multi-modal alternatives, in conjunction with roadway facilities, within the study area, and particularly along the Hunt Highway corridor.

The Maricopa Association of Governments is already considering expanding high-capacity transit to the southeast valley. The MAG Regional Transportation Plan (funded by Proposition 400 that was approved by voters in 2004) contains $5 million dollars for the study, planning, and design of high-capacity transit from the Williams Gateway and Queen Creek area and connecting to Gilbert, Mesa, Tempe, and downtown Phoenix. Although the MAG RTP does not allocate funding for high-capacity transit along this corridor until after the year 2025, local and regional jurisdictions recognize that the rapid pace of development may necessitate high-capacity transit alternatives in this area prior to the year 2025.

The availability of existing infrastructure may facilitate the implementation of high-capacity transit within the study area. The Union Pacific railroad line is a single-track facility with segments of double-tracked sidings. Sufficient right-of-way exists for double-tracking this corridor. A double-track facility would not only enhance the freight capacity of a rail corridor between Coolidge, Florence and the Phoenix metropolitan area, but would enable the rail line to be used for high-capacity transit. A high-capacity transit corridor could

alleviate some of the congestion that is anticipated to occur within the study area by the year 2030 by providing an alternative mode of transportation to commuters and travelers. Commuter rail service from Florence with intermediate stops at five to ten mile spacing could address the peak trip needs of communities along the corridor and could reduce pressure on the regional road system.

The potential for high-capacity transit should be addressed in local jurisdictions' planning efforts including the upcoming Small Area Transportation studies to be conducted by Queen Creek, Pinal County, Coolidge, and Florence.

**Table 2-3 – Needs Analysis Summary: Apache Junction/Coolidge Corridor**

| | Needs Analysis Criteria | | | |
|---|---|---|---|---|
| *Segment No.* | *Criteria # 1 – Is the 2030 local transportation system over-burdened?* | *Criteria # 2 – Are the corridor segments utilized (Do they 'load')?* | *Criteria # 3 – Do the corridor segments improve arterial operations in the study area without replicating arterials?* | *Criteria # 4 – Do the corridor segments improve or establish regional connectivity?* |
| 1 – I-10 to SR-287 | þ Local transportation system will be able to accommodate the projected travel demand in the year 2030. Projected traffic volumes on 2030 Base Network range from 6,000 vpd to 25,000 vpd – well within the capacity limits of a 4-lane arterial. | ý Segment does not attract enough vehicles to warrant a freeway-level facility. The projected traffic volumes south of SR-287 range from less than 4,000 vpd to 18,000 vpd. These are more typical of arterials. Traffic volumes increase on the northern end of the segment, approaching 40,000 vpd at Hunt Highway. | ý Not applicable, as corridor segment does not meet criteria # 2. | ý Not applicable, as corridor segment does not meet criteria # 2. |
| 2 – SR-287 to East Valley Corridor / Riggs Road | þ The 2030 local transportation system, without significant investment, will not be able to accommodate the projected traffic volumes. North-south and northwest-southeast diagonal arterials are particularly overburdened as residents of Coolidge, Florence, and the Hunt Highway corridor require access to employment centers. | þ Traffic volumes increase from 30,000 – 40,000 vpd at Hunt Highway to more than 140,000 vpd. | þ Significantly off-loads parallel arterials. Portions of Hunt Highway are reduced in excess of 20,000 vpd. Traffic volumes on Attaway Rd, Felix Rd, and Valley Farms Rd, are reduced by up to 15,000 vpd. SR-79 is off-loaded by nearly 5,000 vpd. Traffic volumes on east-west arterials that connect to and serve the corridor experience increased traffic volumes. | þ Segment 2 improves connectivity between the Florence/Coolidge, and the Williams Gateway area. Segment 2 connects to the existing state highway system at SR-79 or alternatively at SR-287 |
| 3 – East Valley Corridor / Riggs Road to Williams Gateway Corridor | þ Traffic volumes on north-south arterials including Ironwood, Meridian, Ellsworth Road, and Hunt Highway range from 50,000 vpd to 70,000 vpd – beyond the capacity of 4-lane arterials and nearing the upper range for 6-lane arterials. Additional north-south capacity is needed. | þ This segment would serve nearly 140,000 vpd – a high-capacity, controlled access corridor is required to accommodate these volumes. | þ Segment significantly off-loads parallel north-south arterials. Volumes on Ironwood and Meridian are reduced by up to 30,000 vpd. Un-named future arterials on State Land are reduced by 10,000 – 30,000 vpd. | þ Segment enables connectivity to be established between Florence/Hunt Highway corridor and the Williams Gateway area. |

**Table 2-3 – Needs Analysis Summary: Apache Junction/Coolidge Corridor (continued)**

| | *Needs Analysis Criteria* | | | |
|---|---|---|---|---|
| *Segment No.* | *Criteria # 1 – Is the 2030 local transportation system over-burdened?* | *Criteria # 2 – Are the corridors segments utilized (Do they 'load')?* | *Criteria # 3 – Do the corridors segments improve arterial operations in the study area without replicating arterials?* | *Criteria # 4 – Do the corridor segments improve or establish regional connectivity?* |
| 4 – Williams Gateway Corridor to US 60 | þ Traffic volumes on north-south arterials operate at conditions that approach the capacity of the roadways, though volumes on north-south corridors are somewhat less than those that parallel segment 3. | ý Traffic volumes on the corridor significantly decrease north of the Williams Gateway freeway. Vehicles utilize the corridor to access the Williams Gateway freeway, and subsequently the MAG Freeway system (e.g. Loop 202.). Traffic volumes south of the Williams Gateway exceed 120,000 vpd; volumes north of the Williams Gateway range from 30,000 – 70,000 vpd. | þ Traffic volumes on parallel north-south arterials decrease if the Apache Junction / Coolidge corridor is extended north of the Williams Gateway to the US 60. However, if Idaho Rd is extended south to the Williams Gateway freeway as an arterial facility, in lieu of the Apache Junction corridor, traffic volumes are evenly redistributed to other north-south arterials – each serving approximately 30,000 vpd. | ý Not applicable, as corridor segment does not meet criteria # 2. |

**Table 2-4 – Needs Analysis Summary: East Valley Corridor**

| | Needs Analysis Criteria | | | |
|---|---|---|---|---|
| *Segment No.* | *Criteria # 1 – Is the 2030 local transportation system over-burdened?* | *Criteria # 2 – Are the corridors segments utilized (Do they 'load')?* | *Criteria # 3 – Do the corridors segments improve arterial operations in the study area without replicating arterials?* | *Criteria # 4 – Do the corridor segments improve or establish regional connectivity?* |
| 5 – I-10 to Val Vista Road | þ Local transportation system operates at near-capacity or over-capacity conditions. Roads that provide access to I-10 (Riggs Road between Price Rd and I-10 Rd is particularly over-burdened. Volumes on north-south arterials are generally higher than those on east-west arterials. | þ East Valley corridor along Hunt Highway, when modeled as a freeway facility, loads to approximately 60,000 to 80,000 vpd. | ý East Valley corridor replicates the arterial system. Traffic volumes on Riggs Road are shifted to Hunt Highway / East Valley corridor. East Valley corridor provides no significant benefit to east-west arterials north of Riggs Road. | ý Not applicable, as corridor segment does not meet criteria # 2. |
| 6 – Val Vista Road to Apache Junction / Coolidge corridor | þ Local transportation system is significantly distressed. Discontinuity of the arterial grid system because of diagonals (Rittenhouse Rd., railroad, canals), and geographic constraints (mountains) reduce the efficiency of the local arterial system. | þ Segment is characterized by discontinuous, localized loading between Val Vista and Vineyard Road. As corridor approaches Apache Junction interchange, volumes significantly decrease. These patterns indicate that the corridor is primarily serving local traffic, and not through trips. | þ Traffic volumes on east-west arterials are reduced by up to 10,000 vpd through Queen Creek area. East Valley corridor does not provide noticeable relief to north-south arterials. | ý Corridor, if implemented in its entirety, may improve connectivity between Queen Creek and I-10. However, as segment 5 does not meet criteria, implementation of segment 6 would not establish regional connectivity. |
| 7 – Apache Junction / Coolidge Corridor – US 60 at Florence Junction | ý The local transportation system appears to be able to accommodate traffic within the area that desires access from US 60 at Florence Junction to Queen Creek. | ý East Valley corridor does not attract volumes that warrant a freeway-level facility – projected volumes range from 30,000 to 50,000 vpd. | þ Traffic volumes are shifted from adjacent arterials to East Valley corridor. Adjacent arterials operate well below capacity. | þ Corridor would improve connectivity between US 60 at Florence Junction and Queen Creek. |


**Figure 2-7**
**Needs Analysis Overview**

- Refer to Other ADOT Corridor Definition Studies
- Capacity Justified, Connectivity Achieved
- Additional Capacity not Justified
- Freeway not Justified
- Regional Connectivity not Achieved

**Lanes**

- 2
- 4
- 6
- Future Roadway
- Railroad
- Gila River Indian Community

N

0 1 2 3 4 5 Miles

Data Source:
Arizona Land Resource Information System

PINAL COUNTY CORRIDORS DEFINITION STUDY

Kimley-Horn and Associates, Inc.

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## 2.3 2030 Corridor Concept

The Corridor Concept was developed consistent with the findings presented for the North-South corridor and for the East-West corridor described in **Section 2.2,** and from coordination with study teams for the Williams Gateway corridor and the US 60 corridors.

The Corridor Concept includes a North-South corridor from the Florence north to the Williams Gateway Corridor. The Williams Gateway corridor would then extend westward to ultimately connect with the Loop 202. This combined corridor will significantly improve mobility between the Florence/Coolidge area and southeast Maricopa County. The Corridor Concept is depicted in **Figure 2-8**. Traffic volumes projected for the 2030 Corridor Concept are shown in **Figure 2-9.**

The Corridor Concept includes the following:

- Six-lane, fully access controlled, North-South freeway facility beginning in Florence and extending north to an intersection with the Williams Gateway freeway. Interchanges will be located at a preferred spacing of 2 miles, with a minimum spacing of 1 mile.
- Six-lane Williams Gateway freeway facility extending from the connection with the North-South freeway westward to the Pinal County/Maricopa County line and connecting with the MAG Williams Gateway Freeway. The MAG Williams Gateway Freeway then continues west and connects to the Loop 202. For a comprehensive description of the Williams Gateway Corridor, please refer to the *ADOT Williams Gateway Corridor Definition Study*.
- Six-lane US 60 Re-route. For a comprehensive description of this corridor please refer to the *US 60 Corridor Definition Study.*

As detailed in **Table 2-3,** the Corridor Concept includes two segments of the originally proposed SEMNPTS corridors.

**Table 2-5 – Corridor Concept Segment Descriptions**

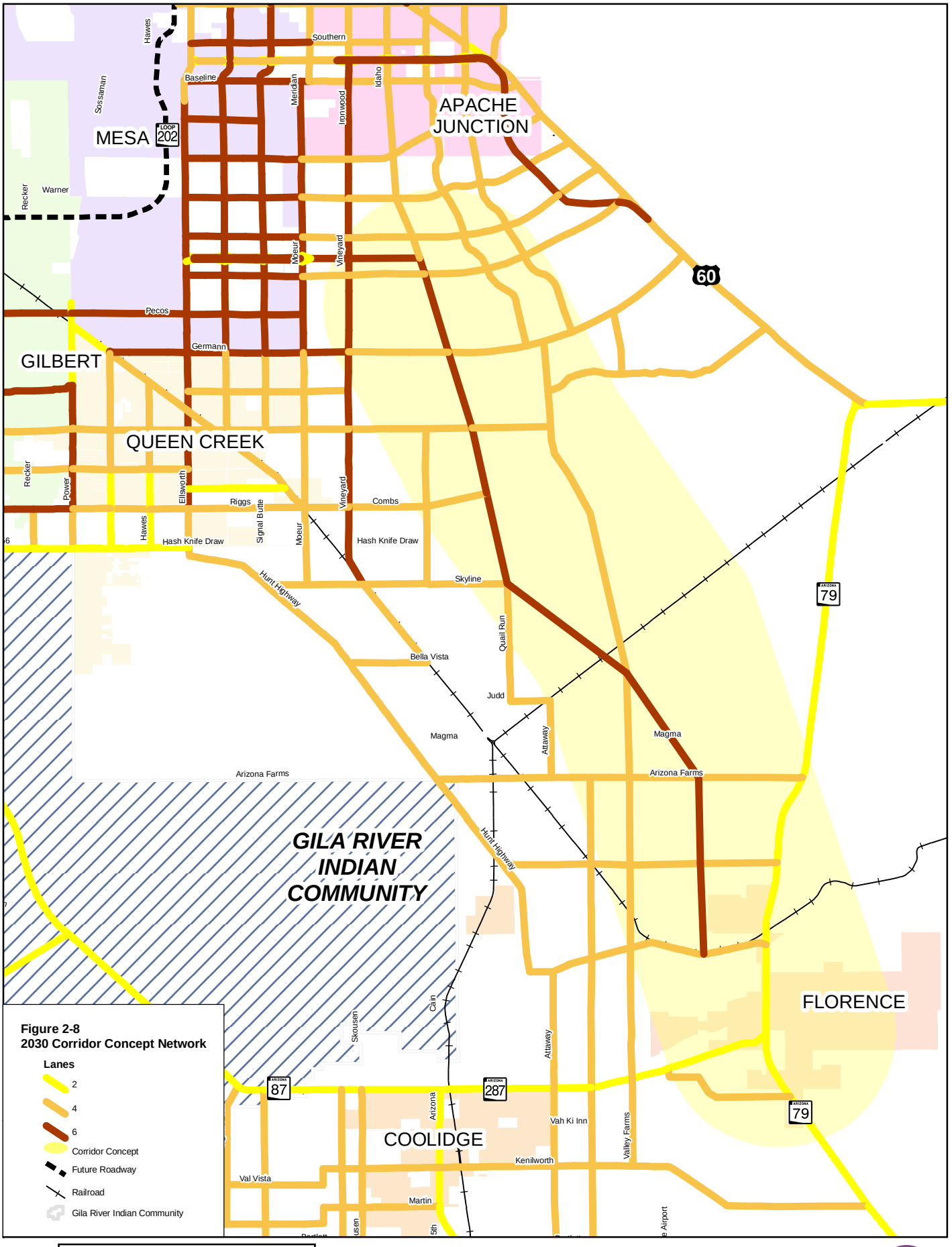
| Corridor Segment | Segment Description | Facility Level and Number of Lanes |
|---|---|---|
| **Apache Junction/Coolidge Corridor (N-S Corridor)** | | |
| 1 | I-10 to SR-287 | Not included in Concept. Corridor may be preserved for corridor implementation beyond the year 2030 by local zoning officials. |
| 2 | SR-287 to East Valley Corridor | Access controlled, 6 lane freeway facility |
| 3 | East Valley Corridor to Williams Gateway | Access controlled , 6 lane freeway facility |
| 4 | Williams Gateway to US 60 | Not included in Corridor Concept. Local jurisdictions may consider developing corridor as a parkway, semi-access controlled facility. |
| **East Valley Corridor (E-W Corridor)** | | |
| 5 | I-10 to Queen Creek | Not included in Corridor Concept |
| 6 | Queen Creek to North/South Corridor | Not included in Corridor Concept. Local jurisdictions may consider developing Riggs Road/Combs Road as a parkway, semi-access controlled facility. |
| 7 | North/South Corridor to Florence Junction | Not included in Concept. Corridor may be preserved for corridor implementation beyond the year 2030 by local zoning officials. |

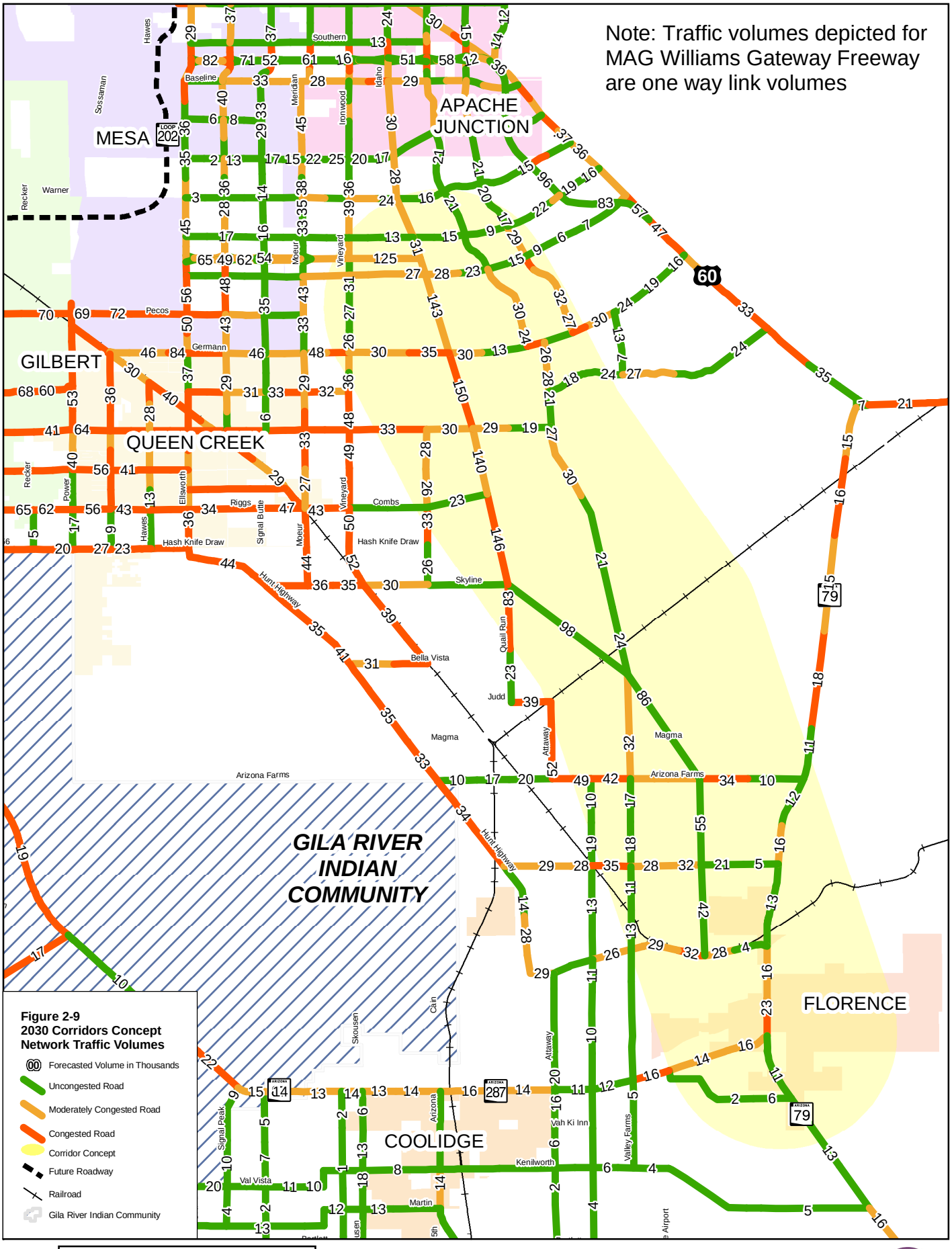
Each corridor segment that is included in the Corridor Concept meets the conditions set forth in the needs analysis criteria. Most importantly, the corridors significantly enhance connectivity between the Florence/Coolidge area, the Williams Gateway area, and the Loop 202, thereby providing relief to an over-burdened local arterial network.

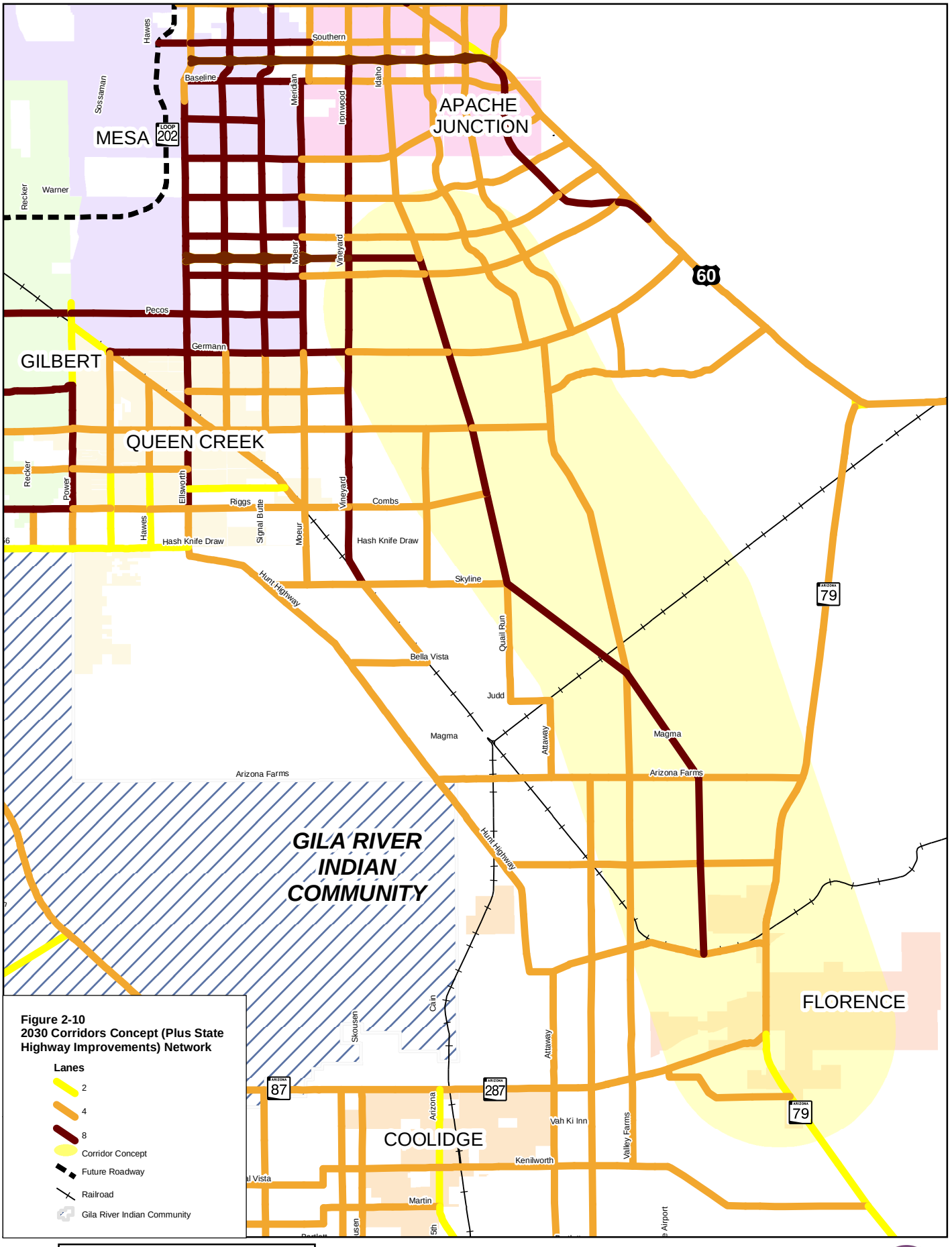
## 2.4 2030 Corridor Concept (Plus State Highway Improvements)

The Corridor Concept (Plus Improvements to State Highways) is depicted in **Figure 2-10**. Traffic volumes projected for the 2030 Corridor Concept are shown in **Figure 2-11.**

Analysis of the scenarios shows that improving the non-interstate state highway system yield some additional relief to the regional transportation system. The additional benefits gained by expanding the non-interstate state highway system are expanded upon in **Section 2.5**


MESA
LOOP 202
APACHE JUNCTION
GILBERT
QUEEN CREEK
COOLIDGE
FLORENCE
GILA RIVER INDIAN COMMUNITY
60
79
87
287
Southern
Baseline
Pecos
Germann
Riggs
Combs
Skyline
Hash Knife Draw
Hunt Highway
Bella Vista
Judd
Magma
Arizona Farms
Kenilworth
Val Vista
Martin
Vah Ki Inn
Hawes
Sossaman
Meridian
Ironwood
Idaho
Recker
Warner
Moeur
Vineyard
Power
Ellsworth
Signal Butte
Quail Run
Attaway
Cain
Skousen
Arizona
Valley Farms
Figure 2-8
2030 Corridor Concept Network
Lanes
2
4
6
Corridor Concept
Future Roadway
Railroad
Gila River Indian Community
N
0 1 2 3 4 5 Miles
Data Source:
Arizona Land Resource Information System
PINAL COUNTY CORRIDORS DEFINITION STUDY
Kimley-Horn and Associates, Inc.
ADOT


Note: Traffic volumes depicted for MAG Williams Gateway Freeway are one way link volumes
MESA
APACHE JUNCTION
GILBERT
QUEEN CREEK
COOLIDGE
FLORENCE
GILA RIVER INDIAN COMMUNITY
Southern
Baseline
Germann
Pecos
Hawes
Meridian
Idaho
Ironwood
Recker
Warner
Sossaman
Power
Ellsworth
Riggs
Combs
Vineyard
Moeur
Signal Butte
Hash Knife Draw
Hunt Highway
Skyline
Bella Vista
Quail Run
Judd
Magma
Attaway
Arizona Farms
Cain
Skousen
Signal Peak
Val Vista
Martin
Kenilworth
Arizona
Valley Farms
Vah Ki Inn
Loop 202
60
79
287
14
Figure 2-9
2030 Corridors Concept
Network Traffic Volumes
Forecasted Volume in Thousands
Uncongested Road
Moderately Congested Road
Congested Road
Corridor Concept
Future Roadway
Railroad
Gila River Indian Community
N
0 1 2 3 4 5 Miles
Data Source:
Arizona Land Resource Information System
PINAL COUNTY CORRIDORS DEFINITION STUDY
Kimley-Horn and Associates, Inc.
ADOT


MESA
LOOP 202
APACHE JUNCTION
GILBERT
QUEEN CREEK
FLORENCE
COOLIDGE
GILA RIVER INDIAN COMMUNITY
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Southern
Baseline
Pecos
Germann
Riggs
Combs
Skyline
Hash Knife Draw
Hunt Highway
Bella Vista
Judd
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Arizona Farms
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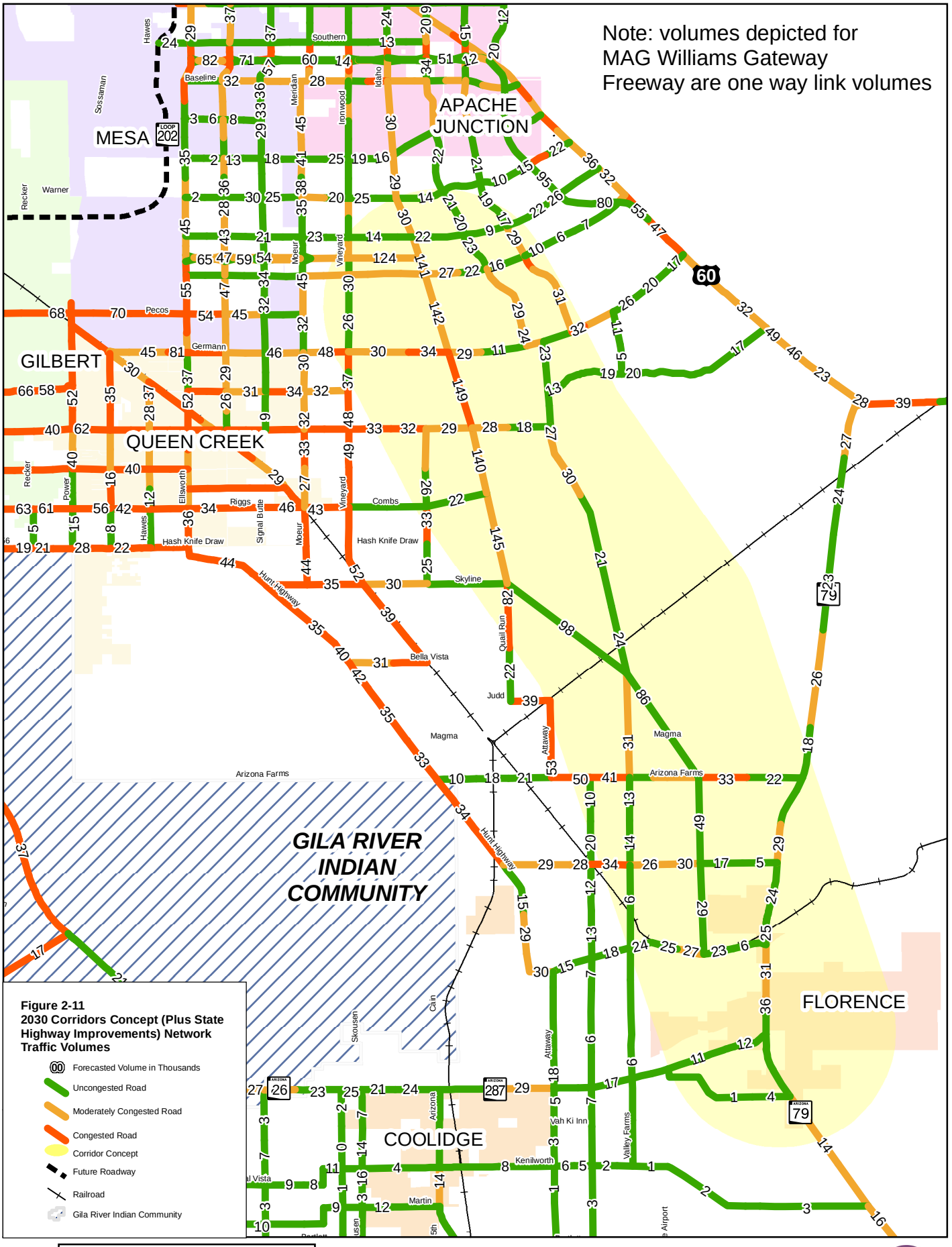
Vah Ki Inn
Hawes
Sossaman
Meridian
Idaho
Ironwood
Moeur
Vineyard
Recker
Warner
Power
Ellsworth
Signal Butte
Quail Run
Attaway
Cain
Skousen
Valley Farms
Arizona
Figure 2-10
2030 Corridors Concept (Plus State Highway Improvements) Network
Lanes
2
4
8
Corridor Concept
Future Roadway
Railroad
Gila River Indian Community
N
0 1 2 3 4 5 Miles
Data Source:
Arizona Land Resource Information System
PINAL COUNTY CORRIDORS DEFINITION STUDY
Kimley-Horn and Associates, Inc.
ADOT


Note: volumes depicted for
MAG Williams Gateway
Freeway are one way link volumes
MESA
APACHE
JUNCTION
GILBERT
QUEEN CREEK
COOLIDGE
FLORENCE
GILA RIVER
INDIAN
COMMUNITY
Southern
Baseline
Pecos
Germann
Riggs
Combs
Skyline
Bella Vista
Hash Knife Draw
Hunt Highway
Magma
Arizona Farms
Kenilworth
Martin
Vah Ki Inn
Valley Farms
Quail Run
Judd
Attaway
Cain
Skousen
Meridian
Idaho
Ironwood
Vineyard
Moeur
Signal Butte
Ellsworth
Power
Recker
Hawes
Sossaman
Warner
Figure 2-11
2030 Corridors Concept (Plus State Highway Improvements) Network Traffic Volumes
Forecasted Volume in Thousands
Uncongested Road
Moderately Congested Road
Congested Road
Corridor Concept
Future Roadway
Railroad
Gila River Indian Community
N
0 1 2 3 4 5 Miles
Data Source:
Arizona Land Resource Information System
PINAL COUNTY CORRIDORS DEFINITION STUDY
Kimley-Horn and Associates, Inc.
ADOT

## 2.5 Regional Traffic Performance

Each network scenario described in **Section 2.1** was evaluated using a common set of performance measures that are linked to key planning factors established by the ADOT's MoveAZ long-range transportation plan. The factors evaluated as part of this process include mobility, accessibility, safety, resource conservation and environmental justice[2]. The results of the evaluation for mobility, accessibility, safety, and resource conservation are summarized in **Section 2.5.1** through **2.5.5**. The reader is referred to the *Corridor Definition Study Performance Analysis* document for a more detailed review of each of these measures including environmental justice analysis. This document is contained in the Appendix to this report.

The results of the performance analysis are used to support the overall analysis of corridors alternatives. The performance analysis presented here is one piece of the overall process, and need to be evaluated in context with other information generated for these studies including:

- The demand for the proposed corridors;
- The impact of the proposed corridors on the congestion of the arterial network, and the existing state transportation system.
- The feasibility of implementing a particular corridor based on considerations of physical and engineering criteria, social and environmental criteria, and land use compatibility, and jurisdictional, stakeholder, and public inputs (which are presented in Chapter 3 of this Working Paper); and
- The system performance and congestion benefits of a new corridor relative to the cost to develop that corridor.

The results presented in this performance analysis are not intended to stand alone. The identification of a recommended corridor concept will utilize this system performance information in concert with the above noted information.

### *2.5.1 Mobility*

The following three key measures are used to estimate mobility:

- **Vehicle miles of travel** (VMT) provides a system-level estimate of total travel on the system. Increases in VMT above the base future scenario reflect latent demand that is not satisfied with the expected future transportation network.
- **Vehicle hours of travel** (VHT) provides a system-level estimate of the total time spent traveling on the roadway network. The relative change in VHT and VMT compared to the base scenario represents travel time savings provided by new investments.
- **Percent of miles** in congested condition provides an assessment of the level of congestion experienced on the roadway network. This measure is captured at two levels. The first level is the percent of highway miles that have a vehicle to capacity ratio over 1 (indicating that the number of vehicles attempting to use the road exceeds the capacity). The second level is the percent of highway miles that have a vehicle to capacity ratio over 1.5. This latter condition can be thought of as roads that are highly congested.

Results of the mobility performance assessment are presented in **Table 2-6**.

[2] Corridor Definition Study Performance Analysis, Cambridge Systematics, Inc. August 2005

**Table 2-6 – Mobility Performance Measures by Scenario**

| Network Scenario | Total VMT | VMT Deviation from Base | Total VHT | VHT Deviation from Base | Percent of Network Congested | Percent of Network Very Congested |
|---|---|---|---|---|---|---|
| Base Future | 32,113,122 | | 4,551,023 | | 41% | 7.9% |
| Enhanced Future | 31,619,784 | -1.54% | 3,261,492 | -28.33% | 32.2% | 3.0% |
| SEMNPTS Corridors | 32,973,195 | 2.68% | 2,682,051 | -41.07% | 26.1% | 2.1% |
| Refined All Corridors | 32,955,369 | 2.62% | 2,497,108 | -45.13% | 24.4% | 1.7% |
| Corridor Concept | 32,438,746 | 1.01% | 3,207,121 | -29.53% | 29.2% | 3.5% |
| Corridor Concept Plus | 32,252,439 | 0.43% | 2,994,424 | -34.20% | 27.9% | 2.8% |

Source: Cambridge Systematics, Corridor Definition Study Performance Analysis, August 2005

The performance assessment indicates that vehicles miles of travel (VMT) grow slightly over the base future scenario for all scenarios, except enhanced future. This growth, ranging between one-half of a percent and about 2.5 percent, represents additional latent demand that is not be satisfied by the base future case. The decline in VMT for the enhanced future of 1.5 percent suggests that trips are more direct in this scenario, but that the additional capacity does not provide improved mobility for the latent demand.

For all scenarios, vehicle hours of travel decline significantly, representing improved travel conditions and the use of shorter travel paths for some trips. The decline in hours of travel is lowest for the Enhanced Future scenario (just under 30 percent) and greatest for the SEMNPTS Corridors scenario (about 45 percent). The Corridor Concept scenario provides just slightly more benefit than the enhanced future, in part due to the additional demand attracted to these new facilities. The Corridor Concept Plus scenario shows much greater benefits, as a number of congested state routes (such as SR 87 through the Gila River Indian Community) are widened to four lanes in this scenario.

Overall congestion declines in each of the scenarios and mileage that is very congested improves significantly. Total congested mileage declines from about 40 percent of all roadway miles in the Base Future scenario to between 25 and 30 percent, depending on the scenario. Again, the SEMNPTS scenario provides the greatest benefit, with the Corridor Concept Plus providing close to the same benefit (within 3 percent). Roadways that are very congested are reduced by over 50 percent in all scenarios (from almost 8 percent to between 1.5 and 3.5 percent).

### *2.5.2 Accessibility*

For this analysis, accessibility captures the ease of access to key activity centers. An indication of regional accessibility is the accessibility to key activity centers in the region such as employment centers, regional shopping centers, airports, and other regionally critical activities. **Figure 2-12** illustrates the distribution of the activity throughout the PCPM model area and identifies five activity centers that were chosen for this analysis: Apache Junction, Chandler, the Williams Gateway Airport, Coolidge, and Casa Grande.

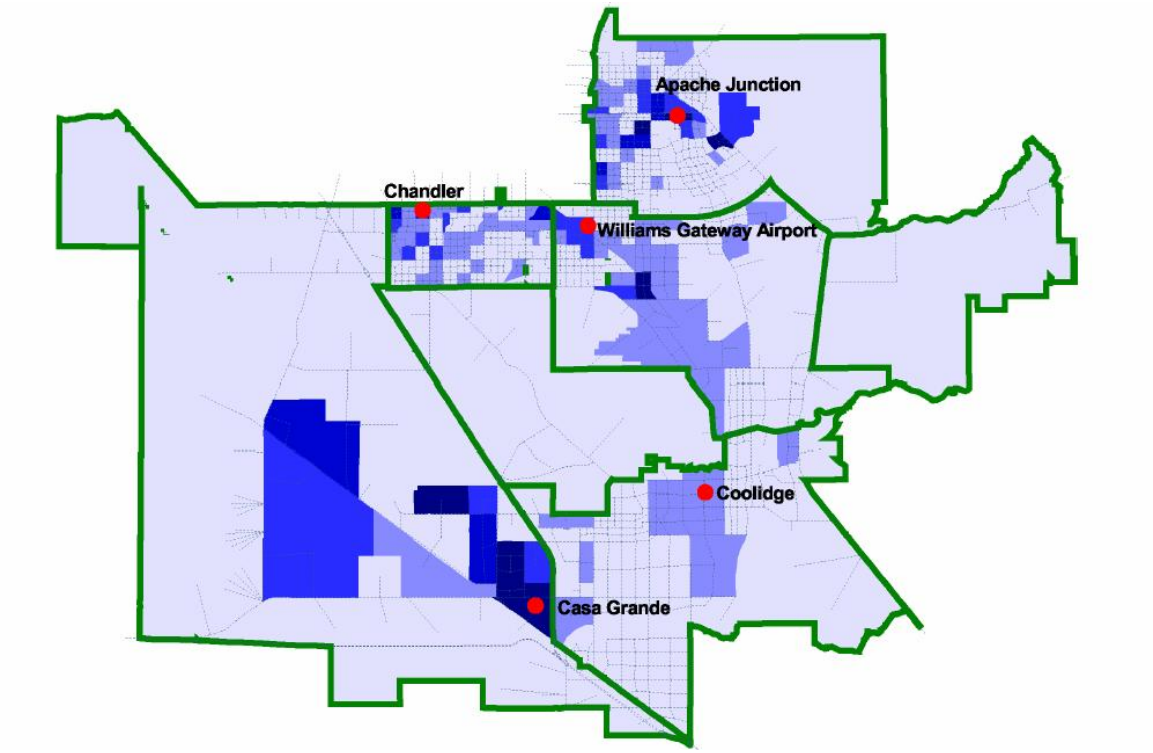



**Figure 2-12 – Distribution of Activity and Selected Activity Centers**
Source: Cambridge Systematics, Corridor Definition Study Performance Analysis, August 2005

Accessibility is presented in two ways:

- Color gradient maps are used to present a geographic representation of the travel time to reach the specific activity centers identified above. These illustrate the amount of time it takes to travel to a zone containing a key activity center, using 15-minute increment bands.
- Trips within travel time bands are also presented for each activity center to understand what percent of total traffic can access each activity center within the travel time bands. The travel time for each trip to the activity center zone is calculated based on the predicted volumes on roadways in the study area and partitioned into the travel time bands. Total trips are presented for zones within a band and the activity center.

The proposed scenarios provided increased accessibility for the major activity centers identified above. **Figure 2-13** presents the portion of study area zones that can access the Williams Gateway activity center within 30 minutes. Results are provided for each of three scenarios: 1) Base Future, 2) SEMNPTS, and 3) Corridor Concept. Zones that are within the bands can be accessed within 30 minutes. Similar results have been developed for 15-minute and 45-minute bands.

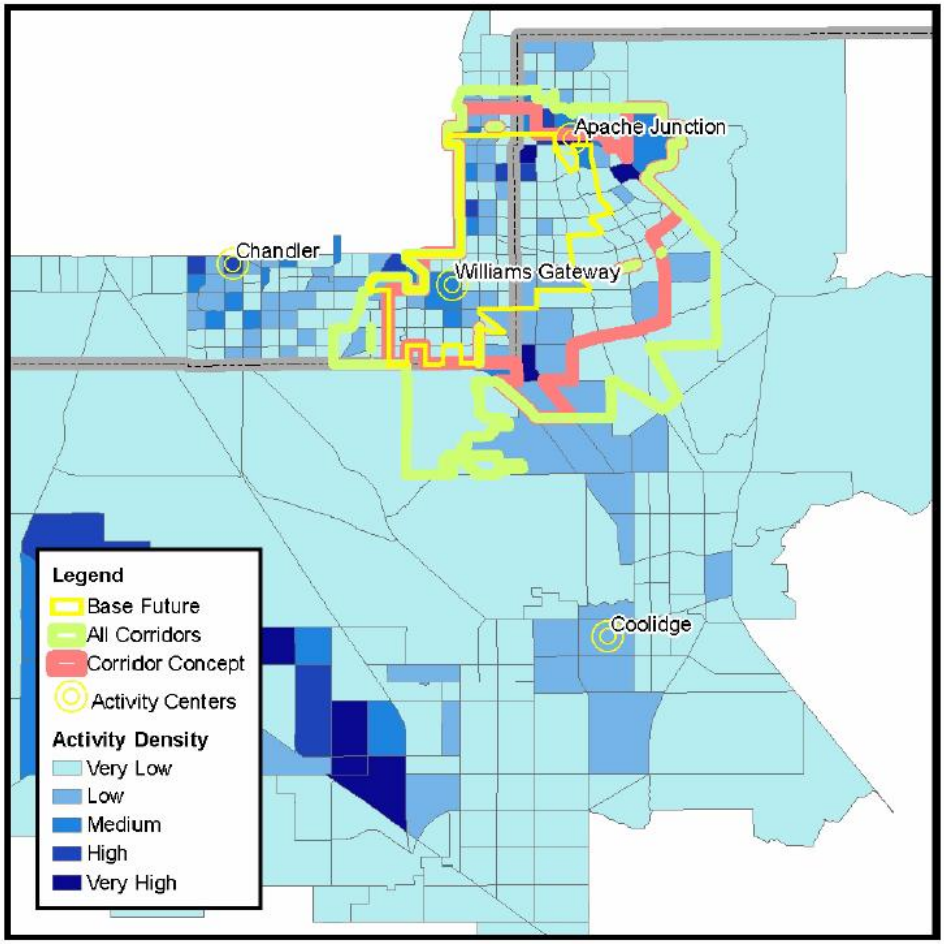



**Figure 2-13 – 30-Minute Accessibility Bands by Scenario (Williams Gateway)**
Source: Cambridge Systematics, Corridor Definition Study Performance Analysis, August 2005

Overall, both the SEMNPTS and Corridor Concept provide improved access to the Williams Gateway activity center. Most of the improved access is on the eastern part of the study area, with the SEMNPTS scenario providing some additional access to the west and south.

**Figure 2-14** presents the same information for the for the Apache Junction activity center. For this activity center, both the Corridor Concept and the SEMNTPS Corridors scenarios provide additional access. Again, the SEMNTPS Corridors scenario provides additional access to the west and south, but relatively less than for the Williams Gateway activity center.

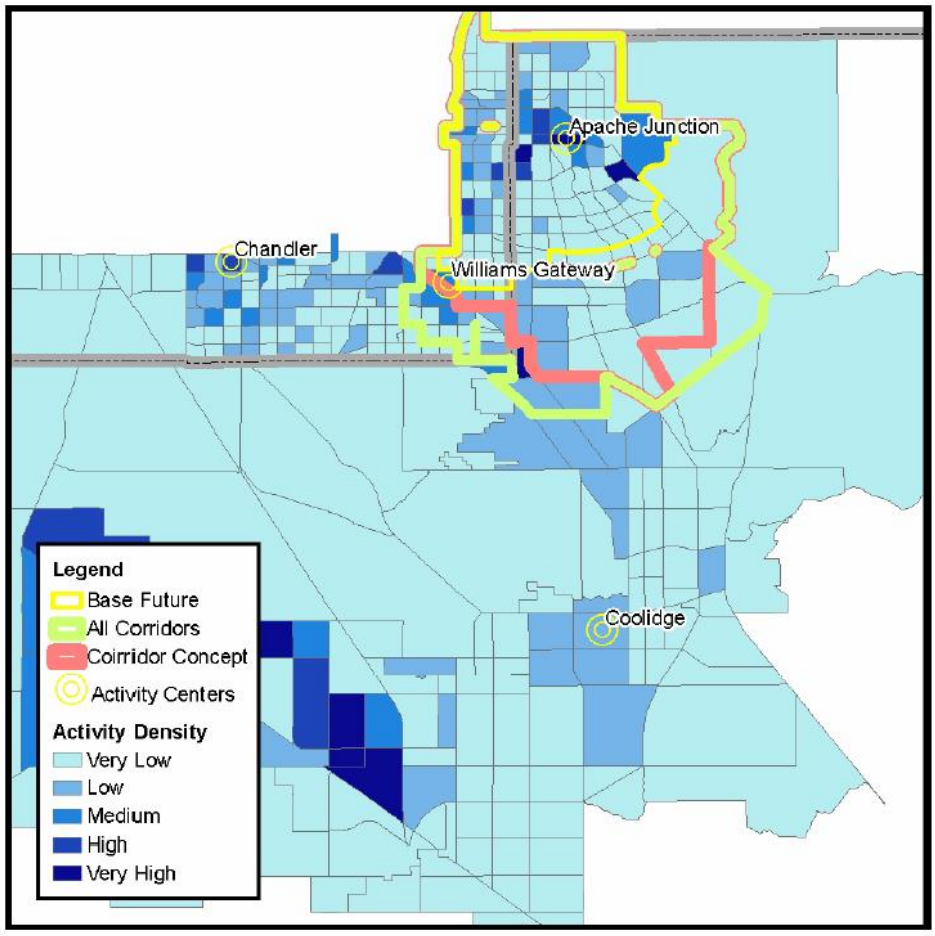



**Figure 2-14 – 30-Minute Accessibility Bands by Scenario (Apache Junction)**
Source: Cambridge Systematics, Corridor Definition Study Performance Analysis, August 2005

The other three activity centers show no real differences among the scenarios in the number of zones that can access the activity centers within 30 minutes.

By examining accessibility at a trip-based level, the impact of each zone becomes clearer. For example, a small zone that produces a large number of trips will be relatively more significant than a small zone that produces few. Also, the number of trips generated by a zone between scenarios may change even if it remains in the same travel time band. Analysis of travel times with respect to the base case shows significant improvement across all activity centers and scenarios. For almost all activity centers, the majority of trips fall within the zero to 15-minute band, and almost none originate outside of the 45- minute band (**Table 2-7**).

**Table 2-7 – Trips within 15-Minute Time Band for Each Activity Center and Scenario**

| Network Scenario | Apache Junction | Chandler | Williams Gateway | Coolidge |
|---|---|---|---|---|
| Base Future | 50.1% | 58.3% | 27.9% | 73.5% |
| Enhanced Future | 55.2% | 63.0% | 28.7% | 82.7% |
| SEMNPTS (All Corridors) | 77.9% | 61.2% | 47.1% | 83.1% |
| Corridor Concept | 73.6% | 60.7% | 30.3% | 81.9% |
| Corridor Concept Plus | 73.6% | 60.7% | 31.0% | 83.0% |

Source: Cambridge Systematics, Corridor Definition Study Performance Analysis, August 2005

### *2.5.3 Safety*

Safety is measured using total crashes by type (fatality, injury, and property damage crashes). Analysis breaks this figure into subcategories – fatality, injury, and property damage-only (PDO) crashes – using predetermined ratios dependant on the network. Crash statistics are presented per million vehicle miles traveled. Findings are presented in **Table 2-8**.

**Table 2-8 – Safety Performance Measures by Scenario**

| | Crashes per Million VMT | | | | |
|---|---|---|---|---|---|
| Network Scenario | Fatalities | Injuries | Property Damage | Total Crashes | Total Crashes – Deviation from Base |
| Base Future | .483 | 46.202 | 66.498 | 113.182 | |
| Enhanced Future | .480 | 45.813 | 66.068 | 112.362 | -0.73% |
| SEMNPTS Corridors | .437 | 41.380 | 59.074 | 100.891 | -10.86% |
| Refined All Corridors | .446 | 42.230 | 60.409 | 103.084 | -8.92% |
| Corridor Concept | .456 | 43.267 | 62.051 | 105.774 | -6.55% |
| Corridor Concept Plus | .456 | 43.214 | 61.987 | 105.656 | -6.65% |

Source: Cambridge Systematics, Corridor Definition Study Performance Analysis, August 2005

The safety analysis findings show that the three corridor scenarios which increase the miles of freeways in the study area (SEMNPTS Corridors, Corridors Concept, and Corridors Concept Plus) have the greatest impact on decreasing accident rates on a system wide level, ranging from 6.5 to almost 9 percent. The change in the Enhanced Future scenario is negligible. For total crashes, the SEMNPTS Corridors scenario which has the greatest number of freeway mileage has the greatest impact with a decrease in total crashes of nearly 9 percent. The difference between Corridor Concept and Corridor Concept Plus proposals on a system wide level is insignificant.

Examining the type of incident, most of the additional benefit realized as part of the SEMNPTS Corridors scenario (over the Corridor Concept and Corridor Concept Plus scenarios) is in property damage crashes. Fatalities and injuries are each only about two percent lower in the SEMNPTS Corridors Scenario. Additional details on the safety analysis

are contained in the Corridor Definition Study Performance Analysis, August 2005 which is provided as an Appendix to this report.

### *2.5.4 Resource Conservation*

The following two performance measures were used to estimate the resource conservation factor:

- Fuel consumption provides a measure of resource use that varies with traffic volumes and congestion levels. Extreme congestion (stop-and-go traffic) leads to high levels of fuel consumption. However, the relationship between fuel consumption and travel speeds is not linear. A completely free-flow travel network will have higher fuel consumption than a moderately congested network. Fuel consumption rates were derived from FHWA's Intelligent Transportation Deployment Analysis Software (IDAS).
- Emissions provide an estimate of the environmental impact of the level of use of the transportation system. Emissions are estimated using the tonnage of key pollutants emitted due to travel on the roadway network. Specific pollutants included in analysis are nitrous oxides (NOx), hydrocarbons (HC), and carbon monoxide (CO). Travel speeds have similar impacts on this performance measure as they do on fuel consumption. Emissions rates were also derived from IDAS for this analysis.

Each of the scenarios leads to a decrease in fuel consumption and the production of emissions relative to the Base Future scenario (**Table 2-9**). This suggests that the various alternatives are moving the network from high levels of congestion to moderate or acceptable levels of congestion. For both fuel consumption and emissions, the SEMNPTS Corridors and Corridor Concept Plus scenarios have the greatest impact. The Enhanced Future and Corridor Concept scenarios show similar improvements to both fuel consumption and emissions, each three to four percent lower than the SEMNPTS and Corridor Concept Plus scenarios. Additional details on resource conservation are contained in the Corridor Definition Study Performance Analysis, August 2005 which is provided as an Appendix to this report.

**Table 2-9 – Resource Conservation Performance Measures by Scenario**

| | Deviation from Base Scenario | |
|---|---|---|
| **Network Scenario** | **Fuel Consumption** | **Emissions** |
| Enhanced Future | -17.1% | -12.8% |
| SEMNPTS Corridors | -15.3% | -15.5% |
| Refined All Corridors | -20.8% | -17.6% |
| Corridor Concept | -15.0% | -12.7% |
| Corridor Concept Plus | -20.8% | -16.1% |

Source: Cambridge Systematics, Corridor Definition Study Performance Analysis, August 2005

### *2.5.5 Environmental Justice*

For a summary of the environmental justice analysis, the reader is referred to *Corridor Definition Study Performance Analysis* document prepared by Cambridge Systematics, Inc, August 2005.